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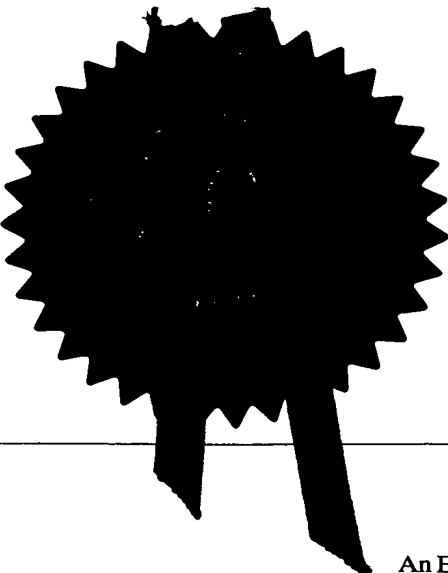
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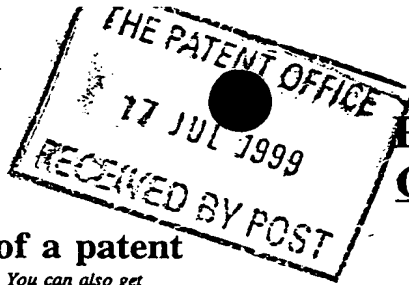
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Patent 77
(Rule 1)



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17 JUL 1999

1.	Your reference	P57781V		
2.	Patent application number (The Patent Office will fill in this part)	9916743.9		19 JUL 99 E462679-1 002813 F01/7700 0.00 - 9916743.9
3.	Full name, address and postcode of the or each applicant (underline all surnames)	<u>Kerr</u> , Jonathan Quinton Bulbeggars Bulbeggars Lane Godstone Surrey RH9 8BJ		
	Patents ADP number (if you know it)			
	If the applicant is a corporate body, give the country/state of its incorporation	*		
4.	Title of the invention	Sterility of Ophthalmic Testing Apparatus		
5.	Name of your agent (if you have one)	Fry Heath & Spence		
	"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)	The Old College 53 High Street Horley Surrey RH6 7BN		
	Patents ADP number (if you know it)	05880273001		
6.	If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or each of these earlier applications and (if you know it) the or each application number	Country	Priority application number (if you know it)	Date of filing (day/month/year)
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7.	If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application	Date of filing (day/month/year)	
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8.	Is a statement of inventorship and or right to grant of a patent required in support of this request? (Answer 'Yes' if: a) any applicant named in part 3 is not an inventor, or b) there is an inventor who is not named as an applicant, or c) any named applicant is a corporate body; See note (d))	* No		

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Description 8

Claim(s) 3

Abstract 1

Drawings(s) 3

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Statement of inventorship and right to grant of a patent (Patents Form 7/77) 0

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11. I/We request the grant of a patent on the basis of this application

Signature *Hy Batho Francis* Date 16 July 1999

2. Name and daytime telephone number of person to contact in the United Kingdom Victoria J Maddison 01293 776880

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STERILITY OF OPHTHALMIC TESTING APPARATUS

This invention relates to ophthalmic apparatus used in the testing and diagnosis of various eyesight defects and eye disorders. In particular the invention relates to such apparatus which come into contact with the patient's eye and to improved prevention of transfer of infection between eyes tested using the apparatus.

The diagnosis of certain eye conditions often requires the oculist to measure certain properties of the eye. Often, the measurement of such properties is most accurately and simply achieved by the use of instruments which contact the cornea of the eye. The most common of these procedures is the Goldman Applanation Tonometry test which is used in the routine measurement of intraocular pressure. Other contact procedures include scan biometry for measuring the axial length of the eye prior to cataract surgery. Another example of a contact procedure is spectral endothelial microscopy which is used to assess the health of the corneal endothelial cells. Similar, but less common procedures include; transillumination, used to view the inside of the eye, pachometry used for measuring corneal thickness and gonioscopy used to examine anterior chamber of the eye.

It is known that various disease-causing microbes can be carried in the tears. Thus there is an infection risk associated with the various contact procedures involving instruments touching the cornea of the eye.

Conventionally the apparatus used in the diagnosis of eye conditions is sterilised by the use of a chemical sterilising agent (eg an alcohol such as

surgical spirit) often provided in the form of a medi-swab or a surgical wipe. Such sterilising agents, if allowed to come into contact with the cornea of the eye, can cause chemical burns which, as the eye is anaesthetised during the test procedure, are often not detected until some time later. In order to prevent damage to the eye, the sterilising agent must either be allowed to evaporate, this can take up to three minutes for each application, or may be washed off with saline solution or alternatively wiped with a dry tissue. When the sterilising agent is allowed to evaporate, this considerably increases the time taken to perform a simple ophthalmic test. Consequently, the sterilising procedure is not always performed when transferring from one eye of a patient to the other and this may result in cross contamination between the eyes of a patient. When dry tissues or saline are used to remove the residual sterilising agent, there is a potential risk that the unsterile tissues and saline may themselves transfer a contaminant to the surface of the ophthalmic apparatus and into the eye of the patient.

A further disadvantage of the conventional sterilising techniques is that the chemical sterilising agents used often do not destroy certain microbial contaminants known to be carried in the tears. One example of such a microbe is the Adeno virus.

It has also been postulated that CJD may be transferred through the tears.

It is an object of the present invention to provide a simple low cost solution to the problems associated with conventional methods of sterilising ophthalmic apparatus.

In accordance with the present invention there is provided a barrier for use in relation to an eye contacting optical testing apparatus, the apparatus having a probe for contacting the eye, the barrier comprising a layer of substantially transparent material having dimensions comparable to the

surface of the head of the probe and being removably fixable to the probe by means which do not affect the transparency of the material layer and the layer being sterile on at least one of its surfaces.

The material may be any transparent material which is relatively inert in a saline or aqueous environment. Preferred materials include polymers such as polyethylene.

Various fixing means may be used to releasably fix the barrier to the probe of the optical apparatus. For example a peelable adhesive may be applied to one surface of the barrier, or alternatively to tabs which affix to the side rather than the head of the probe. Alternatively a suitable material may be chosen such that it will cling by means of static or surface tension to the head of the probe.

In another alternative, the barrier may be fixed to the probe head by means of a collar or a clip associated with the probe which may rely on a friction fit or gripping means.

Preferably, the perimeter of the barrier will in at least one radial direction, extend beyond that of the head of the probe. This provides an easy means of removal from the probe. Various geometric arrangements can be envisaged to provide this removal means on a barrier adapted to fit a typically round probe head of an optical apparatus. Some examples of suitable geometries include a tear drop shape, a square with sides approximately equal to the diameter of the probe head wherein the corners of the square can be used to remove the barrier, or a triangle whose apexes can be used to remove the barrier.

In another option the barrier may be substantially circular in shape with one or more protruding tabs about its circumference.

In order to facilitate easy location of the barrier on the probe head one or more coloured markers or indicators may be provided to define the edge of the barrier or the edge of the probe head on which it is to be placed.

Optionally this marker or indicator may be provided in the form of a coloured ring which is provided to be of a size coincident with the outer perimeter of the probe head. In this case the barrier can be located on the probe head simply by aligning the coloured ring with the perimeter of the probe head. In addition to providing a simple means of locating the barrier on the probe head, the colour indicator may also provide an indication as to which surface of the barrier is sterile where only one surface is sterile. It should be understood that a series of two or more displaced dots, lines or arcs may equally be used to define the area of the probe head.

It will be understood from the preceding description of the barrier of the present invention that such a barrier can be provided relatively inexpensively. Whilst it may be possible to re-sterilise the barrier, it is preferred that the barrier is provided in packs or sheets comprising a multitude of such barriers and that the barriers are replaced between applications and are then disposed of.

In another aspect the invention provides a sheet comprising a number of pieces of substantially transparent material the pieces having dimensions substantially similar to those of the probe head of an eye contacting optical apparatus, the material being sterile on at least one surface.

Preferably the sheet is provided with a backing sheet from which it is peelable. Optionally one surface may be provided with a peelable adhesive, which may also be provided with a backing sheet.

Thus it can be seen that a multitude of disposable ophthalmic barriers ~~according to the present invention can be provided in the convenient form~~

of a sheet provided between two backing sheets. By peeling away one backing sheet the user can reveal the adhesive surface of a barrier, and can position this on the probe head. Once the barrier is located on the probe head, the second backing sheet or a portion thereof can be peeled away revealing the sterile surface. Thus, the sterility of the sterile surface of the barrier is maintained until the barrier contacts the eye under test. The provision of tabs or protrusions as previously described, allows for quick and simple removal of a barrier such that a fresh barrier can be applied before the second eye of the patient or a subsequent patient is tested.

Optionally, the backing sheet adjacent the sterile surface of the barrier may be provided with a coloured marker indicating the outer perimeter of the barrier or of the probe head. This can be provided as an alternative or in addition to the markers previously described in association with the barrier itself. Again, the marker is used by the oculist to align the barrier with the perimeter of the probe head. Preferably the coloured marker is provided in the form of a coloured ring designed to be coincident with the outer perimeter of the probe head. Optionally the non-sterile surface of the sheet of barriers may be provided without a peelable adhesive in such a case separate adhesive may be applied. Alternatively, an adhesive surface may be provided, in a form whereby its adhesive property is dependant on the provision of a separate ingredient such as water. An example of such an adhesive may be found on the conventional postage stamp.

Optionally the sheet with its backing sheets may be provided with perforations by which the oculist can remove a strip comprising any pre-desired number of barriers. Optionally the perforations may be arranged to define individual barriers or pairs of barriers.

For the purposes of exemplification the invention may be further described with reference to the Figures in which:-

Figure 1 shows a first embodiment of a barrier according to the present invention;

Figure 2 shows the embodiment of Figure 1 located on a typical probe head of some optical apparatus;

Figure 3 shows a second embodiment of the invention;

Figure 4 shows three alternative embodiments of the invention;

Figure 5 shows a sheet of barriers according to the present invention;

Figure 6 shows a layout of some barriers according to the present invention with associated backing sheets; and

Figure 7 shows another alternative embodiment of the present invention.

In Figure 1 a barrier 1 comprising a substantially circular piece of transparent material is provided with a coloured ring-shaped marker 2 of comparable size to the perimeter of a probe head 3 located on a probe 4 of a piece of optical apparatus 5. The ring 2 is of comparable dimension to the perimeter of the probe head 3. The barrier 1 is also provided with a protruding tab 6 which can be used as a means of levering the barrier from the probe head once used.

Figure 2 shows the embodiment of Figure 1 arranged on the probe head. As can be seen from the Figure the coloured ring 2 is positioned coincident with the perimeter of the probe head 3. The protruding tab 6 does not communicate with the surface of the probe head 3 and thus can be easily held and pulled to remove the barrier once used. In the embodiments of Figure 1 or 2 the surface of the barrier adjacent the probe

is provided with some form of adhering means.

In Figure 3 an alternative embodiment of the barrier 1 is provided with two protruding tabs 6 on which is provided a patch of adhesive material 7. Once the barrier is located on the probe head by means of colour marking 2, the adhesive tabs 6 are fixed against the sides of the probe 4 to hold the barrier into position.

Figure 4 shows some alternative shapes for the barrier. Figure 4a shows a teardrop-shaped barrier of which the apex 8 features as a convenient tab to aid removal of the barrier following use. Similarly Figure 4b shows a square shaped barrier of which the corners 9 can be used to provide a tab to aid removal of the barrier following use again similarly in Figure 4c a triangular barrier is provided of which the apexes 10 provide a convenient tab means to aid removal.

Figure 5 shows a backing sheet 11 on which are arranged a multitude of barriers according to the invention 1 the sheet 11 is perforated by perforation lines 12 to enable the user to tear off strips or individual barriers to facilitate easier location of an individual barrier.

Figure 6 shows the layout of another alternative embodiment according to the present invention. In Figure 6 a backing sheet 11 is provided with a multitude of coloured rings 2 having dimensions comparable to the perimeter of a typical probe head 3 of an optical apparatus 5. A multitude of barriers 1 having sterile surfaces 14 and surfaces provided with peelable adhesive 13 are arranged on backing sheet 11 in positions coincident with the colour marker rings 2. A second backing sheet 15 is provided to protect the peelable adhesive surface.

Figure 7 shows another alternative embodiment of the invention. A ~~barrier 1 according to the present invention is provided with a collar 16 the~~

collar being of such a size as to provide a friction fit with the walls of the probe 4 which carry probe head 3 of optical apparatus 5. It will be understood that it is not essential for collar 16 to have a friction fit if the barrier is provided with some form of gripping collar (not shown) to hold the collar 16 in position on the head of the probe 4.

The embodiments described in Figure 1 to 7 are just some alternative examples of the invention and are not intended to be limiting.

The skilled reader will understand that in order to maintain accuracy of the optical instruments, the surface of the barrier placed over the probe head should be parallel to and in very close communication with the optical surface of the probe head.

CLAIMS

1. A barrier for use in relation to an eye contacting optical testing apparatus; the apparatus having a probe for contacting the eye, the barrier comprising a layer of substantially transparent material having dimensions comparable to those of the surface of the head of the probe and being removably fixable to the probe by means which do not affect the transparency of the layer and the layer being sterile at least on the surface which is to contact the eye.
 2. A barrier as claimed in claim 1 wherein the barrier is provided with locating means for locating the head of the probe.
 3. A barrier as claimed in claim 2 wherein the locating means comprises a coloured marker.
 4. A barrier as claimed in claim 3 wherein the marker is in the form of a ring having a perimeter of substantially the same dimensions as the perimeter of the probe head.
 5. A barrier as claimed in any preceding claim wherein one or more tabs are provided as a means for easy removal of the barrier.
 6. A barrier as claimed in claim 5 wherein one or more of the tabs are provided with an adhesive substance for retaining the barrier onto the head of the probe.
 7. A barrier as claimed in any preceding claim wherein the barrier is positioned in parallel with the optical surface of the probe head.
 8. A barrier as claimed in claim 7 wherein the barrier is positioned so as to be in communication with the entire surface of the probe head.
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9. A pack of barriers for use in relation to an eye contacting optical testing apparatus comprising a first backing sheet on which are arranged a multitude of pieces of substantially transparent material each having dimensions comparable to those of the surface of the head of a probe of the optical testing apparatus. The surface of the material adjacent the first backing sheet being sterile and the alternative surface of the material being provided with a peelable adhesive, and a second backing sheet to which the multitude of pieces of substantially transparent material and the first backing sheet are adhered by means of the peelable adhesive.
10. A pack of barriers as claimed in claim 9 wherein the first backing sheet is provided with locating means for locating the head of the probe of the optical apparatus.
11. A pack of barriers as claimed in claim 10 wherein the locating means comprises a series of coloured rings having a perimeter substantially coincident with that of the head of the probe of the optical apparatus.
12. A pack of barriers as claimed in any one of claims 8 to 11 wherein the first backing sheet is provided with weakened lines to enable a portion of backing sheet surrounding one or more barriers to be removed by tearing of the backing sheet along the weakened lines.
13. A pack as claimed in claim 12 wherein the weakened lines are provided in the form of perforations.
14. A probe for an eye contacting optical testing apparatus having barrier according to any one of claims 1 to 8 removably fixed to the optical surface of its head.
- ~~15. Use of a probe as claimed in claim 14 in the testing diagnosis of eye~~

defects or disorders.

16. Use of a barrier according to any one of claims 1 to 9 to provide a sterile surface on the probe head of an eye contacting optical testing apparatus.
 17. A method of sterilising the head of a probe of an eye contacting optical testing apparatus comprising positioning a barrier according to any one of claims 1 to 9 over the head of the probe prior to contacting the cornea of the eye.
 18. A barrier substantially as described herein.
-



ABSTRACT

STERILITY OF OPHTHALMIC TESTING APPARATUS

A barrier for use in relation to an eye contacting testing apparatus of the sort having a probe for contacting the eye, comprises a layer of substantially transparent material having dimensions comparable to the surface of the head of the probe and is removably fixable to the probe by means, such as a peelable adhesive, which do not affect the transparency of the material layer. The layer is sterile on the surface which contacts the eye in place of the probe head. Such barriers are disposable and quick and easy to position and replace. Barriers according to the invention can be conveniently provided in sheets comprising multiples of barriers.

Fig. 1

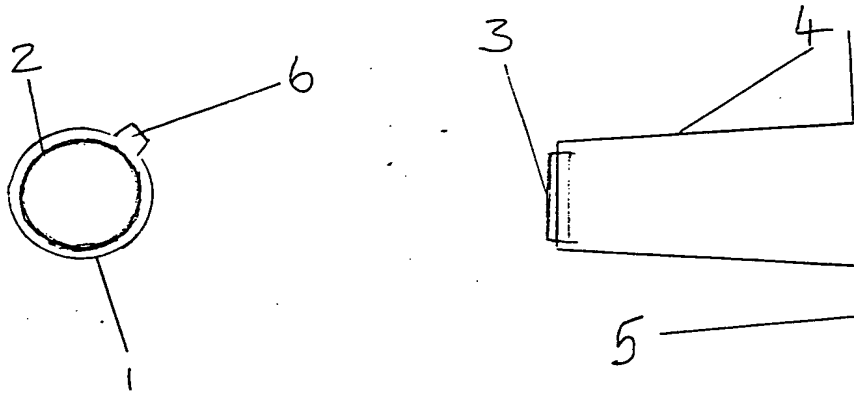
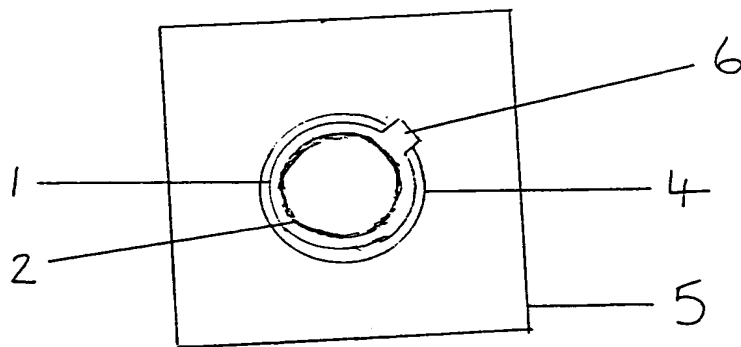


Fig. 2



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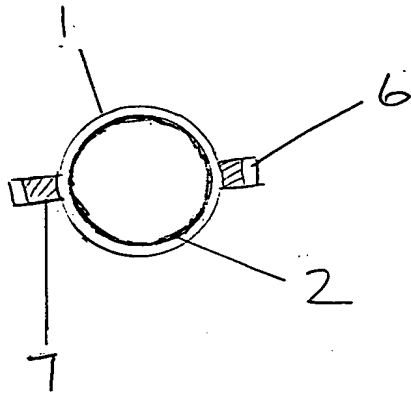
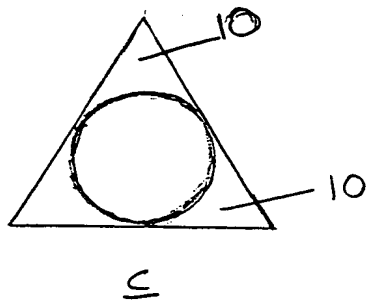
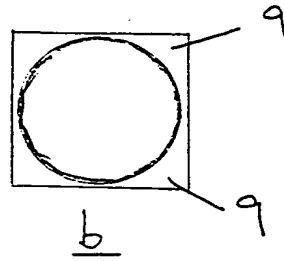
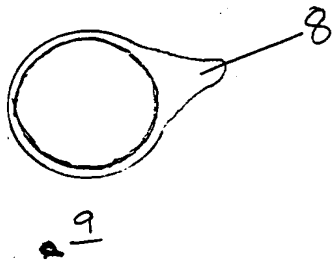
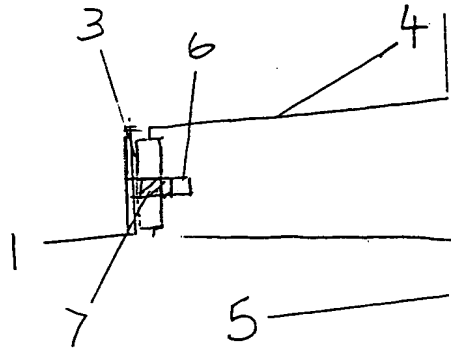


Fig 4



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Spore

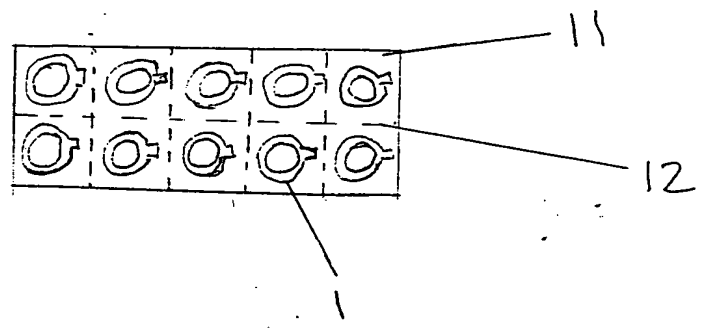


Fig 6

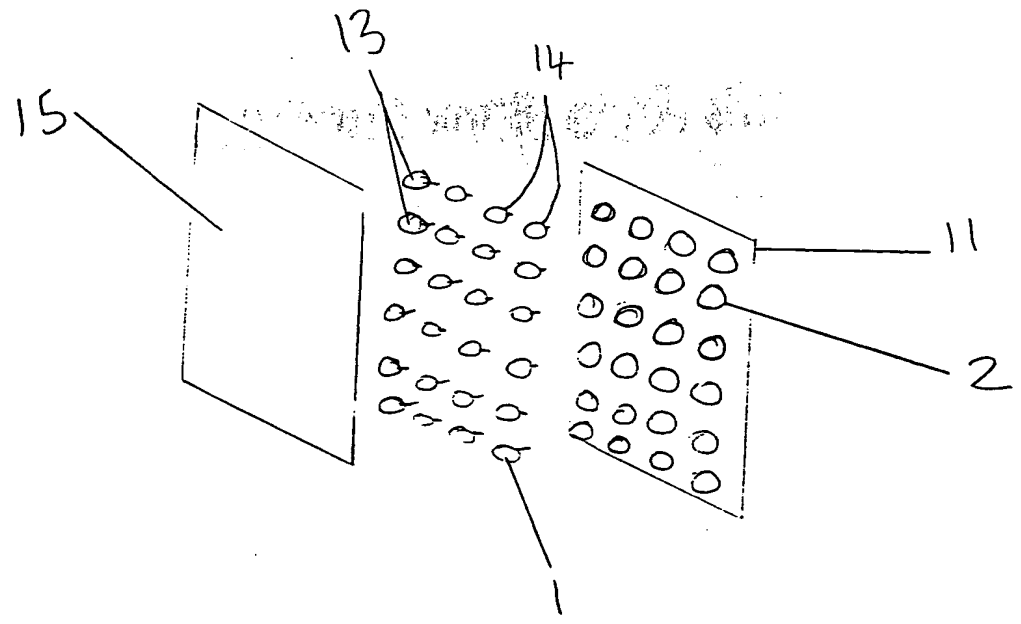
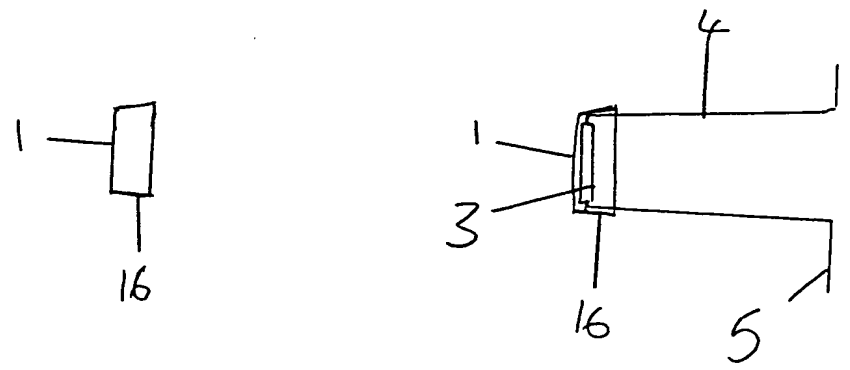


Fig 7



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CLAIMS

1. A barrier for use in relation to an eye contacting optical testing apparatus; the apparatus having a probe for contacting the eye, the barrier comprising a layer of substantially transparent material having dimensions comparable to those of the surface of the head of the probe and being removably fixable to the probe by means which do not affect the transparency of the layer and the layer being sterile at least on the surface which is to contact the eye.
2. A barrier as claimed in claim 1 wherein the barrier is provided with locating means for locating the head of the probe.
3. A barrier as claimed in claim 2 wherein the locating means comprises a coloured marker.
4. A barrier as claimed in claim 3 wherein the marker is in the form of a ring having a perimeter of substantially the same dimensions as the perimeter of the probe head.
5. A barrier as claimed in any preceding claim wherein one or more tabs are provided as a means for easy removal of the barrier.
6. A barrier as claimed in claim 5 wherein one or more of the tabs are provided with an adhesive substance for retaining the barrier onto the head of the probe.
7. A barrier as claimed in any preceding claim wherein the barrier is positioned in parallel with the optical surface of the probe head.
8. A barrier as claimed in claim 7 wherein the barrier is positioned so as to be in

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communication with the entire surface of the probe head.

9. A pack of barriers for use in relation to an eye contacting optical testing apparatus comprising a first backing sheet on which are arranged a multitude of pieces of substantially transparent material each having dimensions comparable to those of the surface of the head of a probe of the optical testing apparatus, the surface of the material adjacent the first backing sheet being sterile and the alternative surface of the material being provided with a peelable adhesive, and a second backing sheet to which the multitude of pieces of substantially transparent material and the first backing sheet are adhered by means of the peelable adhesive.
10. A pack of barriers as claimed in claim 9 wherein the first backing sheet is provided with locating means for locating the head of the probe of the optical apparatus.
11. A pack of barriers as claimed in claim 10 wherein the locating means comprises a series of coloured rings having a perimeter substantially coincident with that of the head of the probe of the optical apparatus.
12. A pack of barriers as claimed in any one of claims 8 to 11 wherein the first backing sheet is provided with weakened lines to enable a portion of backing sheet surrounding one or more barriers to be removed by tearing of the backing sheet along the weakened lines.
13. A pack as claimed in claim 12 wherein the weakened lines are provided in the form of perforations.
14. A probe for an eye contacting optical testing apparatus having barrier according to any one of claims 1 to 8 removably fixed to the optical surface of its head.

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15. Use of a probe as claimed in claim 14 in the testing diagnosis of eye defects or disorders.
16. Use of a barrier according to any one of claims 1 to 9 to provide a sterile surface on the probe head of an eye contacting optical testing apparatus.
17. A method of sterilising the head of a probe of an eye contacting optical testing apparatus comprising positioning a barrier according to any one of claims 1 to 9 over the head of the probe prior to contacting the cornea of the eye.
18. A barrier substantially as described herein.

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